EE/CprE/SE 491 WEEKLY REPORT 1
Jan 23 – Feb 6

Group number: 10
Project title: "Visualizing Probabilistic Whereabouts of Moving Objects"
Client &/Advisor: Goce Trajcevski

Team Members/Role:
Nathan Thoms - To be established
Mara Prochaska - To be established
Eric Jorgensen - To be established
Ryan Cook - To be established

Report Summary

Over the course of the days between January 23rd and February 6th, our team has been getting acquainted with each other, our faculty mentor, and the high-level project objectives. We have identified an end-user for our project as well as developed an introductory understanding of the project through the course of our first student-faculty meeting. Additionally, we have begun thinking about project roles and responsibilities going forward – breaking the project into two categories, both front and backend development teams for our working application deliverable.

Accomplishments

Team :

- Conducted first & second meetings with faculty mentor
- Began researching and reviewing documents provided by faculty mentor

Nathan Thoms:

- Produced a set of 3D visualizations used to further conceptualize material discussed with the faculty member.

- Created a set of annotated notes to be shared amongst the group.

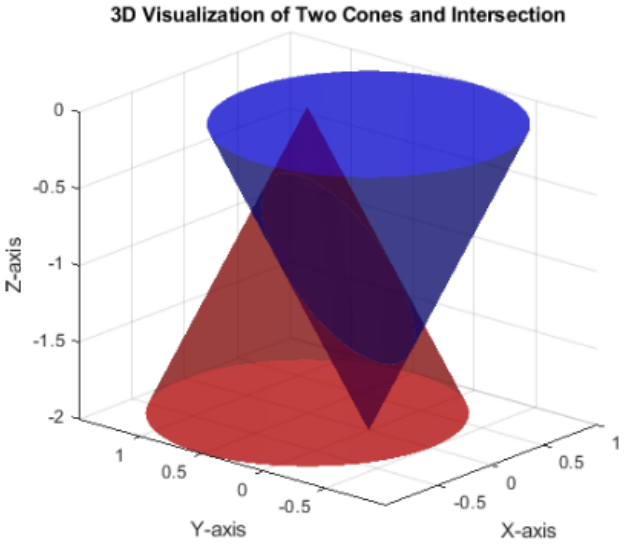

Figure 1 - Possible locations with velocity constraint

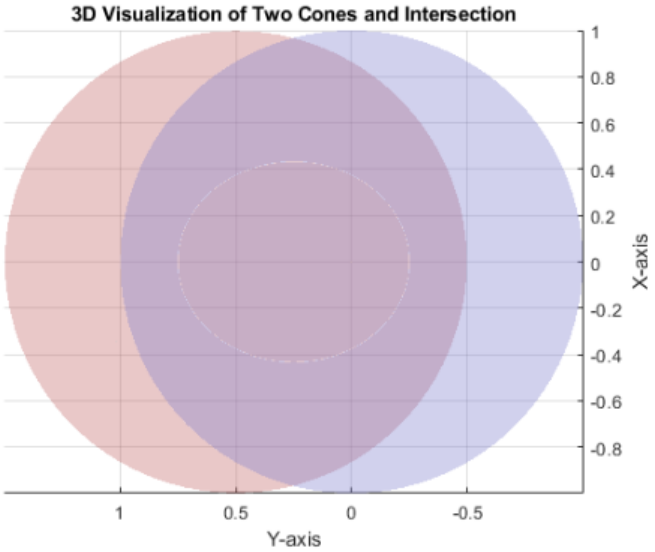

Figure 2 - Innermost ellipse - possible intermediate positions

- Established communication pathway with faculty mentor.

Pending Issues

We currently have no pending issues and have been enjoying learning the applications of this project.

Individual Contributions

Team Member	Individual Contribution	Hours this Week	Hours Cumulative
Nathan Thoms	Produced meeting notes and visualization tools.	3	3
Mara Prochaska	Reviewed reading materials	2	2
Eric Jorgensen	Reviewed supplied materials	3	3
Ryan Cook	Looked over material given by Goce Trajcevski	2	2

Upcoming Plans

In the next advisor meeting, we will be introduced to the datasets and a set of possible algorithms that will be used by the application. We will also continue to research and review the materials provided by our advisor. Once we have a stronger grasp of what the full project will entail, we hope to create more specific roles and tasks for each team member.

Advisor Meeting Summary

During our first meeting, we were introduced to the design problem in greater detail. In summary, the contents of the lecture were related to visualizing the problem in a three-dimensional space - two positional, the third time. This could also be thought of more generally as a two-dimensional feature space where the measured features change with respect to time. Two samples of features are taken at different times and the question is how can you quantify the values the features take in the transition for a sample at time 1 to the second at time 2. Given two constraints – the maximum possible rate of change of features with respect to time, and measurement error you can constrain the feature whereabouts during the transition time. Furthermore, in a three-dimensional space, the problem's geometry can be visualized graphically, as seen in the plots in Figures 1 and 2.

During the second meeting, we discussed the possible applications of the project in greater detail, along with possible inclusions of acceleration and other variables being factors in displaying/visualizing probable whereabouts of objects in space between known instances. We explored several other sources of information relating to our project topic during our second meeting as well. Lastly, we covered other previous reports and deliverables for the project in addition to what will be expected of us during the course of this class.

Possible Users

These are some of the possible users that we went over in our meeting. These users would be possible candidates for how to shape our UI and other aspects of the system.

- Particle physicists
- Chemists
- GPS users

- Traffic uses
- Dynamic systems analysis
- Astronomers

Most users will likely have experience with similar applications. They may be of varying ages and have different educational backgrounds.

Weekly Readings and Materials

1. Uncertain Range Queries and Necklaces

   (Goce Trajcevski, et. all)

2. Towards Fusing Uncertain Location Data From Heterogenous Sources

   (Bing Zhang, Goce Trajcevski, Liu Liu)

3. Maximum Entropy Bridgelets for Trajectory Completion

   (John Krumm)